REMARKS

Claims 1-40 are currently pending in the subject application and are presently under consideration. Claims 1-5, 7-8, 11-12, 14, 19, 22-23, 25, 27-29, 32 and 36 have been amended to further emphasize novel aspects of the applicants' invention. A version of all pending claims is found at pages 2-8. Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I.   Rejection of Claim 28 Under 35 U.S.C. §101

Claim 28 stands rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Specifically, the claim, as filed, was directed to "a signal" which the Examiner contends is a naturally occurring phenomenon that cannot be classified into any of the statutory categories of invention.

It is respectfully submitted that this rejection should be withdrawn for at least the following reason. Claim 28 has been amended to further emphasize the "signal" claimed. In particular, claim 28 has been amended to recite a "computer-implemented signal." Thus, the rejection is moot and should be withdrawn.

II.   Rejection of Claims 29-31 Under 35 U.S.C. §112

Claims 29-31 stand rejected under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claim 29, as filed, recited "the code" in the fifth line of the claim. Accordingly, the Examiner contends that it is unclear whether "the code" refers to the "managed code," the "unmanaged code," or the "code associated with the caller component."

It is respectfully submitted that this rejection be withdrawn for at least the following reason. Claim 29 has been amended to clarify and recite "an in-lined stub within the caller component." Therefore, the rejection of claim 29 (and claims 30-31 which depend there from) should be withdrawn.

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III.   Rejection of Claims 1-40 Under 35 U.S.C. §102(b)

Claims 1-40 stand rejected under 35 U.S.C. §102(b) as being anticipated by
Nilsen *et al.* (U.S. 6,081,665). It is respectfully submitted that this rejection should be
withdrawn for at least the following reason. Nilsen *et al.* does not teach or suggest each
and every limitation recited in the subject claims.

> "A claim is anticipated only if *each and every element* as
> set forth in the claim is found, either expressly or inherently
> described in a single prior art reference." *Verdegaal Bros.
> v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ
> 2d 1051, 1053 (Fed. Cir. 1987). Emphasis added. "The
> identical invention must be shown in as complete detail as
> is contained in the...claim." Richardson v. Suzuki Motor
> Co., 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir.
> 1989).

The subject invention as disclosed and claimed relates to a system and method to
enable communications between one or more (*e.g.*, *managed to unmanaged*) object
systems. Additionally, the system and method of the subject invention *employs an in-
lined stub functionality to facilitate operational performance and communications*
between the object systems. (*See* pg. 1, ln. 7-10).

More particularly, the invention provides for a system and/or methodology that
facilitates *communications and execution performance between managed and
unmanaged code* environments. This facilitation is achieved by providing functional
aspects and considerations of an *in-lined stub* incorporated within an execution
framework of a calling function *between managed and unmanaged code*. In other
words, this novel *"in-line stub"* can be utilized *in lieu* of calling an external interface stub
at run time. (*See* pg. 3, ln. 10-15).

Independent claim 1, as amended (and similarly amended independent claims 14,
25, 27, 28, 29, 32 and 36) recites a system that *facilitates communicating between
managed and unmanaged code*. Specifically, as claimed, the subject invention provides
a first component that is *managed code* and a caller associated with the first component.
As recited in the independent claim, the caller invokes an object related to a second

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component, the second component being *unmanaged code*, the <u>*caller's code includes an in-lined stub that facilitates communications to and execution management of the object*</u>.

Nilsen *et al.* fails to teach or suggest such aspects of the claimed invention. Rather, Nilsen *et al.* merely teaches a method for use in executing portable virtual machine computer programs under real-time contstraints. (*See* Abstract). In accordance therewith, as further described *infra*, the cited reference is not directed to a system that employs an in-lined stub to communicate and manage unmanaged code as claimed in the subject application.

Applicants' representative respectfully submits that Nilsen *et al.* is silent with regard to any system including managed and unmanaged code as claimed in the subject application. Although the Office Action contends that FIGS. 1-6 and 94 and 95, together with the corresponding portions of the Nilsen *et al.* specification disclose such a system, applicants' representative respectfully submits that this is merely an assumption. The "Garbage Collected Heap" reference in FIG. 1 of Nilsen *et al.* may lead one to assume the system employs "managed code", Nilsen *et al.* is completely silent with regard to any reference of "unmanaged code."

As defined by the subject application, "managed" objects may be allocated from a heap within a managed software environment and are generally not responsible for managing associated object lifetimes. Managed objects may be described in terms of a data type (*e.g.*, metadata) and automatically collected (*e.g.*, reclaimed) by a managed environment "garbage collector" that removes the object from memory when the object is no longer being accessed. In contrast, "unmanaged" objects may be allocated from a standard operating system heap, wherein the object itself is responsible for freeing memory it employs when references to the object no longer exist. This may be accomplished through well-known techniques such as reference counting, for example. (*See* Background, pg. 1-2, ln. 30-8). Nilsen *et al.* is completely silent with regard to any reference to "unmanaged" code.

Moreover, applicants' claimed in-lined stub can facilitate higher processor execution performance than conventional systems and methods of calling an external stub

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routine to manage the performance of unmanaged code. Contrary to assertions made in the subject Office Action, Nilsen *et al.* does not teach or suggest employment of an in-lined stub as recited in the subject claims. Rather, Nilsen *et al.* is silent with regard to an in-lined stub that manages performance of an unmanaged code as recited in the subject independent claim(s).

Furthermore, applicants' representative respectfully submits that Nilsen *et al.* employs an external stub to facilitate object communications and management *in lieu* of an in-line stub as in the claimed invention. In limited circumstances (*e.g.*, "special" (non-virtual) method invocation) Nilsen *et al.* simply describes a small procedure stub that is generated to represent each byte-code and native method in the system (*See* col. 15, ln. 49-58). Although the Office Action contends that Nilsen *et al.* anticipates the claimed invention, applicants' representative respectfully submits that Nilsen *et al.* does not teach or suggest the use of an in-lined stub that facilitates communication to *and execution management* of the object (*e.g.*, unmanaged code) as disclosed and claimed in the subject application.

Rather, Nilsen *et al.* merely suggests that "when performing special method invocation from within a JIT-translated method, *the address* of the called method (or at least a stub for the called method) is hard-coded into the caller's machine code." (*See* col. 14, ln. 4-6). Additionally, although Nilsen *et al.* simply suggests *hard-coding the address of the called method,* it should be noted that, in accordance with Nilsen *et al.* this address is only hard-coded when the method to be invoked by a particular operation is known at compile time. (*See* col. 13, ln. 66-67). In other words, the invocation of special methods discloses that non-virtual method calls resemble virtual method invocations except that the code to be implemented is determined by the declaration (at compile time) rather than by the current instantiation (at run time).

Applicants' representative respectfully submits that Nilsen *et al.* describes four distinct forms of method invocation. Specifically, the reference discusses (1) virtual, (2) special (non-virtual), (3) static, and (4) interface forms of method invocation. In accordance therewith, as noted *supra*, only the "special (non-virtual)" form mentions

hard-coding the address of the method to be called. This "special" form does not disclose _execution management of unmanaged code_ as recited in the subject claim(s).

Nilsen _et al._ employs an _external stub_ to facilitate object communications and performance management. In particular, although Nilsen _et al._ describes a small procedure stub that is generated to represent each byte-code and native method in the system, the reference does not describe hard-coding this stub procedure. (_See_ Col. 15, lines 49-58). The subject invention as recited in the claims does not employ an external procedure stub as described in the cited reference. Rather, the subject invention _incorporates stub functionality within a calling function_ without relying upon any external or generated procedures. (_See_ FIG. 1 and functionality emphasized in the subject dependent claims). In this manner, performance can be enhanced over conventional stub processes.

In view of the above, it is readily apparent that Nilsen _et al. does not anticipate or suggest a system of managed and unmanaged code having an in-lined stub that facilitates communications to and execution management of the object_ as recited in independent claims 1, 14, 25, 27, 28, 29, 32 and 36 (and claims 2-13, 15-24, 26, 30-31, 33-35 and 37-40 which respectively depend there from). This rejection should be withdrawn.

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CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

AMIN & TUROCY, LLP
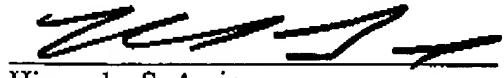
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